

SHENGTAIHUANJING YU

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ZHONGGUOGUOJI JINGZHENGLI

# 生态环境与 中国国际 竞争力

中国国际贸易与FDI的  
新挑战和新选择



中国经济出版社  
CHINA ECONOMIC PUBLISHING HOUSE

中国国家社会科学基金资助项目

中国博士后科学基金资助项目

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北京

图书在版编目 (CIP) 数据

生态环境与中国国际竞争力 / 曾凡银著. —北京: 中国经济出版社, 2006. 7

ISBN 7 - 5017 - 7606 - 7

I. 生... II. 曾... III. ①生态环境—研究—中国  
②国际市场—市场竞争—研究—中国 IV ①X171.1 ②F752

中国版本图书馆 CIP 数据核字(2006)第 056757 号

出版发行: 中国经济出版社 (100037 · 北京市西城区百万庄北街 3 号)

网 址: [www.economyph.com](http://www.economyph.com)

责任编辑: 朱祝霞 (Tel: 68319283 Email: [julia\\_bj2003@yahoo.com.cn](mailto:julia_bj2003@yahoo.com.cn))

责任印制: 石星岳

封面设计: 华子图文设计公司

经 销: 各地新华书店

承 印:

开 本: A5 印 张: 6.75 字 数: 190 千字

版 次: 2006 年 7 月第 1 版 印 次: 2006 年 7 月第 1 次印刷

书 号: ISBN 7 - 5017 - 7606 - 7/F · 6321 定 价: 22.00 元

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服务热线: 68344225 68369586 68346406 68309176

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## 摘 要

全球经济一体化、区域经济的集团化,使关税水平进一步降低,但非关税壁垒尤其是以保护生态环境为名的绿色壁垒则层出不穷,本书揭示了绿色壁垒产生的内在原因与其变化规律,提出了具有三重基本结构的绿色壁垒的壳层结构,研究了其经济效应;建立了绿色壁垒的风险预警与防范机制,设计出了提升基于生态环境的中国国际竞争力的制度体系、政策框架和提升机制,不仅具有重要的理论价值,而且具有很强的现实意义。

(1) 构建了贸易壁垒价格梯度场的空间控制模型,指出发达国家设置绿色壁垒的目的和中国完善生态环境技术标准的理论与政策意义。通过贸易壁垒价格梯度场的空间控制模型的建立,说明在汇率和国际价格保持相对稳定的情况下,贸易壁垒价格梯度的高低与贸易壁垒本身的大小成正向变化关系。在关税税率普遍降低的国际背景下,发达国家、新兴工业化国家、甚至发展中国家或地区为了保护本国产品和产业,必然会寻找关税的替代技术,而绿色壁垒既符合他们的期望,也顺应保护生态环境的时代潮流。中国的对外贸易额已位居全球第三,贸易依存度已高达70%,因此,既屡屡遭遇发达国家绿色壁垒的损害,产品出口屡屡受阻,又深受其转移污染物品、FDI及其生产技术设备的影响,在中国关税税率逐步降低的情况下,应该完善生态环境技术标准体系,形成相应的价格梯度场空间控制机制,促进中国基于生态环境的产品、产业的国际竞争力的提升,跨越发达国家等为此专门设置的绿色壁垒,又限制与生态环境相关的污染产品、FDI及其技术设备的输入,实现绿色壁垒对关税壁垒的替代效应。

(2) 建立了成本梯度空间场变化模型,揭示了生态倾销、绿色壁垒与污染产业空间转移的真正成因。以成本梯度为因变量,以成

本、要素价格等为自变量，建立了成本梯度空间场模型；基于模型变量之间的关系可知，生态环境技术标准的变化使企业生产的外部成本发生变化，从而引起总成本梯度数量的变化，进而影响企业利润最大化的路径的大小。发展中国家生态环境技术标准相对较低，内在化的外部成本的增长率较小，产业、产品的国际竞争力相对较强，利润的增长率较大，被发达国家认为是生态倾销，所以设置绿色壁垒加以限制；发达国家生态环境技术标准日益严格，外部成本的增长率较大，利润的增长率较小，为实现利润的最大化目标，企业会通过 FDI 进行高污染、高物耗、高能耗产业的空间转移，即进行外部成本 - 收益的空间异置。

(3) 提出了具有三重基本结构的绿色壁垒的空间壳层结构，研究了其经济效应。根据绿色壁垒的空间梯度变化特征，将产生绿色壁垒的全球性环境贸易条款、区域性环境贸易协定和国别性环境贸易措施作为变量，建立贸易壁垒空间的价格梯度场模型，从模型的变量之间的关系可以看出，绿色壁垒空间的三个壳层结构之间和各个壳层结构内部都存在着梯度变化关系，梯度值的变化是由外向内依次递增，突破的难度依次增大，作为发展中国家的中国产品出口量在日益增加，必须有针对性的采取相应的制度、经济、技术措施，对这种绿色壁垒的空间壳层结构实施逐层突破，并建立相应的危机预警与防范体系，才能增强出口产品的基于生态环境的国际竞争力。

(4) 剖析了以制度创新为基础的技术创新对中国绿色国际竞争力提升的重要作用。中国出口产品绿色竞争力较弱，常被发达国家诉之为生态倾销，而屡次遭遇绿色壁垒各个壳层结构的限制，关键在于制度缺陷下的企业基于生态环境的技术创新动力不足。生态环境资源产权制度、适当的知识产权制度和以生态环境规则为基础的开放的市场机制与政策激励措施，是充分利用人力资本促进基于生态环境的技术创新的基本动力。在开放经济中，首先实现制度的蛙跳效应，促进人力资源潜能的有序开发，为技术蛙跳提供知识基础和智力支撑；制度的激励和人力资源的支持，促成企业进行针对产

品、生产过程和生命周期等方面的技术创新，从而创新技术、创新技术标准、创新认证，最终根据绿色壁垒的壳层结构，实现有目的的逐步跨越，提升基于生态环境的中国产业、企业、产品的国际竞争力。

(5) 建立了绿色壁垒的风险预警与防范机制，设计出了制度体系和政策框架，研究了基于生态环境的中国国际竞争力的提升机制。绿色壁垒有三个壳层结构，为提高中国出口产品的国际竞争力，必须根据绿色壁垒的梯度变化情况和由此可能带来的出口风险级别，确立相应的技术情报收集、处理与传递渠道，构建内部数据指标监测报告网络系统和风险评估、预警体系，逐步形成以民间和官方有机统一的对外、对内相协调的风险应急处理与控制体系。提高中国基于生态环境的国际竞争力的制度设计包括生态环境资源的产权制度、许可证交易制度、生态环境技术标准制度、生态环境标识制度、清洁生产制度等；与之配套的是创建市场与政府有效干预有机结合、并鼓励公众参与的生态环境经济政策体系。在经济全球化中提升中国基于生态环境的国际竞争力，需要“开放市场”、“创新能力”和“广泛参与”的“三位一体”的三个要素支撑。通过生态环境资源的制度创新、宏观微观管理创新和资金系统的保障，激励人力资源的开发，从而创新技术、创建技术标准、创新认证和标识，在提升创新能力的过程中实现开放市场中的生态环境技术标准的双向调控，并广泛地参与国际生态环境经济的进程和事务，在政府、企业、行业协会和消费者等各个行为主体的共同作用下，突破绿色壁垒的各个壳层结构。

(6) 运用提出的基本理论和政策，分析了中国农产品绿色国际竞争力的提升机制，并研究了提升基于生态环境的中国工农业产品国际竞争力的两个案例。由农产品绿色壁垒壳层结构的特征可知，生态环境标准意识薄弱、农业技术水平较低、生产技术标准滞后、农业生产规模化与专业化程度低、政府监管体制僵化等是制约中国农产品绿色国际竞争力的内在因素。强化技术标准意识，进行制度创新、管理创新、技术创新，创建农产品技术标准与认证体系，从

而跨越绿色壁垒的壳层结构。海尔跨越绿色壁垒的基本方略是通过遵守国际生态环境管理标准跨越国际性条款，果敢决策、标准超前而跨越区域性绿色壁垒，本土化建厂、参与标准制定而跨越国别性绿色壁垒。强大的技术研发、质量检测、信息网络等保障体系，是支撑海尔产品基于生态环境的国际竞争力提升的基础。山东省通过建立健全与国际、区域、国别接轨的地方技术标准体系，实行相互递进的农业生产、加工标准体系、检验检疫的质量保障体系、产品质量认证体系等，夯实了农业产业基础，不断推进农业生产加工的组织化、标准化、产业化和国际化，从而突破了绿色壁垒的各个壳层结构，使农产品出口量稳步递增，农民收入稳步增长。

综上所述，在研究内容上，界定了基于生态环境的中国国际竞争力的概念；构建了贸易壁垒价格梯度场的空间控制模型，指出发达国家设置绿色壁垒的目的和中国完善生态环境技术标准的理论与政策意义；揭示了生态倾销、绿色壁垒与污染产业转移的真正成因；提出了具有三重基本结构的绿色壁垒的壳层结构，研究了其经济效应；建立了绿色壁垒的风险预警与防范机制，设计了提升基于生态环境的中国国际竞争力的制度体系、政策框架和机制。在研究方法上，运用了经济科学、管理科学和数理等自然科学交叉学科的方法，解决了当前绿色壁垒与国际竞争力理论研究定量较少的瓶颈问题，将定量的模型构建与实证分析有机的结合，提出了较为可行的制度设计思路和政策建议，提出了从空间范围解决问题的全新的思路。

**关键词：**生态环境；国际竞争力；国际贸易；FDI

## Abstract

Global economic integration and regional economic unity have caused a further reduction of tariff rate, but non – tariff – rate barrier, especially the green ones with the name of ecological – environment – protection, appears one after another. In terms of these green barrier, this dissertation reveals the internal causes and the developing rules, presents a three – level – shell structure of green barrier and the economic effect, constructs risk – warning and prevention mechanism against green barrier and designs an institutional system, a policy framework and a bettering mechanism to promote China’s international competitiveness based on ecological environment, which is not only of important theoretical values, but of useful practical significance.

(1) Constructing the spatial price gradient field control model under trade barrier, revealing the purposes of green barrier of developed countries and demonstrating the theoretical and policy importance of China’s perfection of the technical standard for ecological environment. With the construction of the spatial price gradient field control model under trade barrier, this dissertation demonstrates the positive relationship between the price gradient under trade barrier and trade barrier on the supposition of the comparative stability of exchange rate and international price. Under the circumstance that tariff rate is universally decreasing, developed countries, newly – industrialized ones and even developing countries or regions are certain to seek substitute standard for the tariff rate in order to protect their national products and industries. What can meet the demand is green barrier, which goes with the present times of ecological environ-

ment protection. China's external trade amount has taken the third place with its trade dependence reaching 70%. Suffering again and again from the green barriers of developed countries, which put china's commerce export into trouble, meanwhile from the transfer of their pollutants and their out - dated technical equipments, China ought to perfect its own green technical standard system and constitute it's own spatial price gradient field control mechanism for the promotion of China's international competitiveness of products and industries based on ecological environment. The aims are to cross the green barriers set by developed countries, to control the in - put of pollutants and out - dated equipments and to substitute trade barrier for green one.

(2) Constructing the spatial cost gradient field changing model and revealing the true causes of ecological dumping, green barrier and pollutant transfer. With cost - gradient as dependent variables and cost and factor price as independent variables, a spatial cost gradient field model has been established, on the bases of whose variables, the changes of ecological environment technical standard initiate the changes in external production cost of an enterprise, then lead to the changes of total cost gradient amount, and finally affect the maximum approach for the profit of an enterprise. So far as a developing country is concerned, with its comparatively low ecological environment technical standard and its slow increase in the internalization of externalities, its industries and products are more competitive in international market and more profitable, which is regarded as ecological dumping. That's the reason why developed countries set green barrier to ban the products from developing countries. On the other hand, with more strict ecological environment technical standard fast increase in the internalization of externalities and slow increase in profit, an enterprise in a developed country will transfer its high - pollution, high - material - wasting and high - energy - wasting industries, that is, to conduct the spatial separation of externalities cost and

benefit for the maximum of its profit.

(3) Demonstrating a three – level – shell structure of green barrier and analyzing the economic effects. In line with the characteristics of green barrier spatial gradient changes, global environment trade treaties, regional agreements trade treaty and national environment trade measures will surely come into being. With these as independent variables, a spatial price gradient field model under trade barrier can be established. From the relationship of the independent variables in the model, it can be found that there exists gradient changing relationship among the three levels of the green barrier shell structure and even within each level of the shell structure. The gradient rate grows from outside to inside with more and more difficulty. Being a developing country with increasing export, China has to take systematic, economic and technical measures in view of this situation, to break through these spatial shell structure of green barrier one level after another and constitute its own risk – warning and protective mechanism. Only in this way can China strengthen the international competitiveness of its export products based on ecological environment.

(4) Analyzing the importances contributed by the technical innovation based on systematic innovation to the promotion of China's international green competitiveness. China is weak in green products competitiveness exported abroad, which is often charged with ecological dumping by developed countries and easy to be restricted with the green barriers of the shell structure levels. The knot lies in the shortage of enterprises' technical innovation motive concerning with environment supervised by imperfect policy. An environmental resource property system, a suitable system of intellectual property rights and an open market mechanism as well as policy – stimulating measures in view of environmental principles, are the essential motive to make full use of human resource capital for the technical innovation based on environment. In an open economy, what

should be realized first of all is institutional leapfrogging for the ordered exploitation of potential human resources and for a knowledgeable foundation and intellectual support for the technological leapfrogging. Systematic stimulus and human resource support will motivate enterprises to carry on technical innovation in accordance with their products, productive processes and life cycles, and then carry on all – round technical innovation, technical innovation standard, innovation licenses and at last in line with the shell structure of green barriers to purposefully cross them for the promotion of China's international competitiveness of the industries, enterprises and products based on environment.

(5) Constructing risk – warning and prevention mechanism against green barrier, designing an institutional system, and a policy framework and researching China's international competitiveness promotion mechanism based on ecological environment. Green barriers forming a three – level shell structure, in order to strengthen China's international competitiveness of its export products, what must be done is how to gather, process and deliver the intelligence in line with the gradient changing state of green barriers and with the export risk degree and how to constitute a internal network system and a risk evaluation, risk – warning system for digital index supervision. So that an emergency management system will come into being which coordinates official and non – official elements to deal with the affairs both at home and abroad. The system for the promotion of China's international competitiveness based on ecological environment consists of the environment resource property system, the trade permission conformity certification system, the environment technical standard system, the ecological environment logo system, clean production system etc, gearing with which is the establishment of the policy system to organize the market and the government intervention as well as encourage the public to take part in ecological environment economy. In order to reach this stage, the most important supporting elements are

open market, innovative capability and a wide range of participation with trinity. By the means of ecological environment system innovation, macro – micro management innovation and capital system security, human resources will be exploited to innovate technology, technical standard and conformity certification with logo. In the process of promoting innovation capability, the double – dimensional control of ecological environment technical standard can be realized in open market situation and widely participate in the advancement and affairs of international ecological environment economy to cross each of the level of the shell structure of green barriers with the joint efforts of government, enterprises, trade associations and consumers.

(6) Analyzing China's international competitiveness promotion mechanism for agricultural products with given basic theories and policies and demonstrating two cases of promoting China's international competitiveness of agricultural and industrial products. Compared with the agricultural green barriers of the shell structure, the internal causes of China's low international competitiveness of agricultural products lie in the weak consciousness of ecological environment standard, low agricultural technology, backward productive technical standard, small – scale agricultural production with low specialization, rigid government supervision system and so on. So What must be done is to strengthen technical standard consciousness, initiate system innovation, management innovation, technical innovation, build agricultural product technical standard and conformity certification system for the crossing of the green barriers of the shell structure. The essential strategy of Haier Co. LTD for the crossing of the green barriers of the international treaties is to abide by the international environment management standard, make decisively policies, make advanced standard to cross regional green barriers, localize branches, and participate in standard making to cross national green barriers. Its powerful technical research, quality evaluation and information net-

work etc play the most important role in the promotion of Haier's international environment competitiveness. With the establishment and the perfection of the local technical standard system gearing with global, regional and national standards, Shangdong Province is developing with mutual promotion its agricultural production, processing standard system, quality security system for inspection and quarantine, product quality conformity certification system and so on, enhancing its agricultural foundation, improving its organization, standardization, industrialization and internationalization for the agricultural product processing. So the province has broken through the green barriers of the shell structure and steadily increased its agricultural product export amount, from which the farmers accelerate their income.

In generalization, for the contents, this dissertation has defined the concept for China's international competitiveness based on environment, constituted the spatial price gradient field control model under trade barrier, revealed the purposes of green barrier of developed countries and demonstrated the theoretical and policy importance of China's perfection of the technical standard for ecological environment, revealed the true causes of ecological dumping, green barrier and pollutant transfer, demonstrating a three - level - shell structure of green barrier and analyze the economic effects, Constructed risk - warning and prevention mechanism against green barrier, designing an institutional system, and a policy framework and researching China's international competitiveness promotion mechanism based on ecological environment. For the methods, with the combined ones from economy, management and mathematics - physics approaches of science, this dissertation has worked out the bottle - neck problems concerning with the theoretical research of present green barrier and international competitiveness by the means of quantitative analysis. With the organic combination of quantitative analysis and qualitative analysis, a comparatively practical train of thought for institutional

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design has been put forward with some policy suggestions, which presents a totally new problem – resolving thought from spatial view.

**Key words: ecological environment, international competitiveness, international trade, foreign direct investment (FDI)**

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